REMARKS/ARGUMENTS

Claims 1 - 2

As recited in claim 1, as amended, the present invention provides a computer aided bone densitometry system which calculates a bone mineral data set indicating x-ray attenuation caused by bone, measures the bone mineral data set to evaluate the likelihood that acquisition of the signals was faulty, and provides an indicator of faulty acquisition to the operator when the evaluation of the bone mineral data suggests that the data acquisition is likely to be faulty. Faulty images, as recited in dependent claims 2 – 15, are likely to occur due to foreign objects in or around the patient, patient motion, improper patient position, an insufficient volume of soft tissue is detected, or other factors present during data acquisition. The presence of any of these conditions can result in faulty data collection which render the results of the analysis suspect, and suggest the desirability of acquiring additional data rather than relying on the results.

Claims 1 – 2 were rejected under 35 U.S.C. Section 103 as unpatentable over Ohmoto, U.S. Patent Number 5,348,090 in view of Arnold, U.S. Patent Number 4,922,915.

Ohtomo disclose an apparatus for providing assessment indices related to bone strength which are useful in predicting the risk of bone fracture, including as one step the measurement of the mineral density of bone (BMD) by means of X-rays.

Arnold discloses a medical imaging system which uses a histogram analysis technique for analyzing nonhomogeneous tissues. Nonhomogeneous are tissues that include other materials or combinations of tissue components within the boundaries of

the defined region of interest. For example, these tissues can include two or more

tissue components, such as muscle and fat or trabecular bone and fat. Alternatively,

the tissue can include contrast agents such as Gadolinium-DTPA in MRI, and iodine-

based agents in CT and digital radiography.

Neither of the cited references teaches a method in which faulty acquisition

conditions are detected and an indicator is provided to the operator. Arnold is cited as

providing these elements of the claim, based on the statement in the abstract that

"undesirable" components are excluded in the calculation of tissue density. Arnold,

however, does not teach a method for determining when data acquisition is faulty. On

the contrary, Arnold teaches a method for differentiating various types of tissues in

acquired data. The system, as described above, separates pixels of acquired date into

classes of various tissues types for quantifying tissue densities. When quantifying any

one type of tissue, other types will be considered "undesirable", i.e. fat tissue

concentrations will be undesirable when calculating bone density, and vice versa.

These determinations are not related to whether the original acquisition was faulty.

Moreover, the system does not provide an indicator to the user when faulty data is

found.

Claims 3 - 5

Claims 3 – 5 were rejected as unpatentanble over Ohmoto, Arnold, and further

in view of Nowak, U.S. Patent Number 4,858,128.

Nowak discloses an imaging system of a type producing a plurality of X-Y

matrices representing projection views of an object for later reconstruction using parts

of a plurality of the views employs correlation techniques for determining the amount

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of motion along X and Y axes. The detected motion may be removed by suitably shifting later data to align it with earlier data, or vice versa. Again, this is not a system which determines whether an acquisition is faulty and then provides an indicator signal to a user, but rather is a system which attempts to correct acquired data to account for motion. Moreover, the correction is made only for one type of acquisition problem.

None of the cited references, therefore, provides a system which determines that data acquisition was faulty and then provides an indicator to the user that the data may be faulty. Nowak, in fact, teaches away from such a system, instead providing a system in which corrections are made to the data. As none of the cited references teach a system as provided in claim 1, the Applicants respectfully request that the rejection of claims 3 – 5 under 35 U.S.C. Section 103(a) be withdrawn.

Claims 6 - 22

Claims 6 – 22 were rejected over Ohmoto, Arnold, Nowak, and further in view of Mazess, U.S. Patent Number 6,160,866. Mazess discloses a bone densitometry system in which the location of one femur of the patient is used as an estimate of a starting location for the second femur. A leg positioner can be used to position the legs in a horizontal plane. Again, Mazess neither teaches nor suggests providing a warning to the operator when the patient is mispositioned. Furthermore, while discussing methods for scanning a second femur based on the position of the first femur scanned, Mazess does not discuss any method for determining mispositioning of the spine, as recited in claims 8, 10, 11, and 12. Therefore, the Applicants

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respectfully request that the rejection of claims 6 – 15 under 35 U.S.C. Section 103(a)

be withdrawn.

In addition to dependent claims 6 – 15, claims 6 –22 include two additional

independent claims, claims 16 and 18. Claim 16 is directed to a computer aided bone

densitometry system which calculates a bone mineral data set indicating x-ray

attenuation caused by bone for a plurality of points based on operator input defining

portions of the bone mineral data set for quantitative measurement. The portion

defined by operator input is compared to a portion automatically derived from the

bone mineral data set, and provides an <u>indicator if the operator input deviates from the</u>

<u>automatically derived input by more than a predetermined amount</u>.

Claim 18 is directed to a computer aided densitometry system which

calculates a bone mineral data set indicating x-ray attenuation caused by bone,

analyzes the bone mineral data set to produce a value indication of bone health,

compare the value indication of bone health to a standard range of values, and outputs

an <u>indication to the operator that the indication of bone health may be erroneous if the</u>

<u>value indication is outside the standard range</u>.

Again, none of the cited references provide an indicator either if operator input

deviates from automatically derived input, as recited in claim 16, or if a value

indicated is outside of a standard range, as recited in claim 18. Therefore, the

Applicants respectfully request that the rejections of claims 16 – 22 under 35 U.S.C.

Section 103(a) also be withdrawn.

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<u>Conclusion</u>

In view of the foregoing arguments, the Applicants respectfully request that the rejections of claims 1 – 22 under 35 U.S.C. Section 103 be withdrawn and that a notice of allowance be issued.

The Commissioner is authorized to charge any fees under 37 C.F.R. § 1.17 that may be due on this application to Deposit Account 17-0055. The Commissioner is also authorized to treat this amendment and any future reply in this matter requiring a petition for an extension of time as incorporating a petition for extension of time for the appropriate length of time as provided by 37 C.F.R. § 136(a)(3).

Respectfully submitted,

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